DOCUMENT RESUME

ED 174 299 JC 790 498

AUTHOR Atkins, Karen B.
TITLE The Utilization of Cognitive Style Mapping of Students to Determine and Implement Alternative Instructional Strategies.
PUB DATE 20 Nov 78
NOTE 63p.; Ed. D. Practicum, Nova University

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS *Cognitive Measurement; Cognitive Processes; *Cognitive Style; Community Colleges; Educational Counseling; *Effective Teaching; Individual Differences; *Individual Instruction; *Junior Colleges; Junior College Students; Student Testing; Teaching Methods
IDENTIFIERS Cognitive Style Interest Inventory

ABSTRACT

An educational cognitive style map was prepared for each new student in the Allied Health Division of Spartanburg Technical College in Fall 1978. The Cognitive Style Map Interest Inventory was administered and individual profile sheets were developed for each of the 130 students in the division. These profile sheets provided a composite picture of the ways in which different students derive meaning from their environment, e.g., through auditory or visual means, or through abstract or concrete reasoning. Faculty members of the division, after a series of preparatory workshops on cognitive style and instructional methodology, diagnosed the learning styles of their students and developed instructional strategies and teaching techniques corresponding to each individual. Advising and counseling sessions were held with each student throughout the quarter to discuss the mapping process and the implications of the student's particular learning style. The faculty composed cognitive style profiles on each department within the division, evaluated present instructional methods, and proposed alternative methods based on the cognitive preferences of their students. Results of the departmental mappings and proposed educational plans are appended. (DR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED174299

THE UTILIZATION OF COGNITIVE STYLE MAPPING OF STUDENTS TO DETERMINE AND IMPLEMENT ALTERNATIVE INSTRUCTIONAL STRATEGIES

by
Karen B. Atkins
Spartanburg Technical College

A PRACTICUM PRESENTED TO NOVA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF EDUCATION

Nova University

November 20, 1978

JC 790 498

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Karen B. Atkins

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ABSTRACT

The purpose of this practicum was to utilize the cognitive style maps of the new students of the Allied Health Division to assist in the determination and ultimate implementation of alternative instructional delivery strategies within the division.

There was a need within the division for the instructors to become more familiar with a variety of instructional delivery methods, with the subsequent production and the appropriate implementation of each. This need was met while utilizing the cognitive style maps of students to promote individualization of the instructional modes.

Cognitive style maps were obtained on all new students during the fall quarter orientation. Later the instructors used the mapping results to discuss learning styles with the students during individual advising-counseling sessions held with each student during the first week of the quarter.

The faculty participated in a series of In-Service workshops on Cognitive Style Mapping, Diagnosing and Prescription Writing, and Instructional Methodology and Technology.

The faculty composed cognitive style class profiles on each department within the division. During sessions with the divisional dean, information was formulated on present instructional strategies utilization and plans were made for future alternative instructional strategy enhancement and implementation.

A summary of the recommendations was that future utilization of CSM and alternative instructional strategies take place both within the division and throughout the college, to improve teaching effectiveness while meeting the individualized learning styles of every student.

TABLE OF CONTENTS

TITLE	PAGE
INTRODUCTION	1
BACKGROUND AND SIGNIFICANCE	4
PROCEDURES	18
RESULTS	24
DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS	27
REFERENCES	33
APPENDICES	
A. In-Service Workshop Schedule	37
B. Instructional Delivery Methods and Utilization Program	38
C. Instructional Strategies Session	39
D. Departmental CSM Class Profiles of Students	40
E. Plans for Enhancement and Future Utilization of Alternative Instructional Strategies and Materials	50
F. Present Instructional Strategies and Materials	56

INTRODUCTION

The purpose of this practicum was to utilize the cognitive style maps of new students to assist in the determination, and ultimate implementation of alternative instructional delivery methods in the departments of the Allied Health Division. The additional utilization of Cognitive Style Mapping (CSM) was an extension of a practicum which was conducted in the Learning Theories Module in which the beginning step was to map the instructors in the division with the ultimate goal being to use the mapping process to improve instructional strategies, reduce student attrition and allow for a more conducive learning atmosphere for the students.

A need existed within the division for the instructors to become more familiar with a variety of instructional delivery methods, with the subsequent production and the appropriate implementation of each. This need was met while utilizing the cognitive style maps of students to promote individualization of the instructional modes.

A major goal of the Allied Health Division for 1978-1979 is to continue to utilize CSM to enhance learning and to improve and revise delivery systems as indicated by students' CSM's. This practicum was structured to facilitate the attainment of that goal.

Efforts to improve education usually take the form of curriculum revisions, new teaching methods, new or revised school organization or intensive efforts in some particular area such as math or chemistry. Increased demands from all segments of the population for accountability in education have placed educators in a rather precarious position. They are being called upon to find more efficient and more effective ways of educating students at a time when educational dollars are becoming

increasingly scarce. Now more than at anytime in history, demands are being made on the educational system to be more sensitive and responsive to the needs of the individual learner (Sleeman and Rockwell, 1974). Now on the basis of numerous research studies a fundamental, useful, effective tool is being implemented--the determination and utilization of individual cognitive styles--in the educational process (Labouire, et. al., 1975; Stevenson, 1976; Marjoribanks, 1976; Hill, 1976; and Nunney, 1975). Cognitive style is the way a person obtains knowledge or "comes to know." Rohwer (1970) says that a major factor in the area of educational and psychological research involves individual differences--the isolation and description of sources and determinants of individual differences--and then the design of instruction which is responsive to these individual differences. This trend toward utilization of individual cognitive style maps has begun to emerge over the last few years in the educational field as exemplified in the work of Hill (1976) and Nunney (1975).

Solomon (1976) quotes Cross as saying, "educational innovation require much more than mere change. It requires a careful analysis of the needs and problems of learners and the implementation of creative solutions."

The utilization of CSM to diagnose and prescribe instructional strategies is an educational innovation that demands attention with resultant creative implementation.

The prospect of ultimate utilization of individual differences toward effective learning in schools and colleges, as well as in other areas, is very promising and very exciting. Educators must stop using individual differences as a means of determining who succeeds or who fails and instead adapt the educational system and enhance teaching techniques in order to better meet the needs of the individual learner. A major factor in the success or failure of the endeavor will be willingness on the part of

those in the field of education to accept the challenges of determining and utilizing the individual's own particular, personal style of "coming to know."

Educators should be cognizant of the fact that the effectiveness of instructional modes varies with respect to students' aptitude patterns and sincere efforts must be made to diversify techniques for transmitting knowledge (Sleeman and Rockwell, 1976).

The mapping process used in this practicum was the one developed by Dr. Joseph Hill (1976). According to Hill (1976) there are seven educational sciences. This practicum deals with the one entitled "Cognitive Styles of Individuals" and involves the usage of the educational cognitive style mapping process as developed by Dr. Hill and his associates.

The procedures for this practicum began with a series of In-Service workshops on Cognitive Style Mapping. (See Appendix A.) The workshops were conducted by the CSM Counselor for the Allied Health Division Faculty. The divisional counselor was included in the CSM workshops to promote communication between the division and the counseling center and to continue to familiarize the divisional counselor with Cognitive Style Mapping procedures. Involving counselors in the assessment processes, instruction, and other classroom activities is supported by Berg (1972) and others. The workshops involved learning (or refreshing) of CSM concepts, CSM diagnosing and prescribing and a practical session using the maps of the new students. Cognitive Style Maps on new students were obtained during fall quarter orientation. After the students' maps were diagnosed and prescriptions made, individual advising-counseling sessions were held with each student during the first week of the fall quarter to discuss the mapping process, the results, and the personal implication for each student. In addition, a series of sessions were conducted on Instructional Delivery Methods and Utilization. (See Appendix B.)

After the workshop sessions, the faculty members of each department met with the divisional dean to discuss student maps and general CSM configuration of the various classes. The effective utilization of the most appropriate instructional delivery methods were discussed and plans were made to begin preparing alternative delivery methods which would meet the needs of the individual students within a class or within a classroom cluster, which was made up of students with similar style of "coming to know."

During the departmental sessions with the divisional dean, each departmental faculty presented a CSM profile of the students in their department, diagnoses and prescriptions for each student and then with the assistance of the divisional dean, developed recommendations and implementation plans for changes in instructional delivery strategies as indicated. Each department listed the instructional methods presently in use within the department.

A follow-up meeting was held between the divisional dean and the CSM counselor to review the diagnoses, prescriptions, utilization plans for the alternative instructional strategies and to evaluate the project results in general. The College President and Vice President for Academic Affairs were kept abreast of the project and were informed concerning the project expectations, results, and recommendations.

BACKGROUND AND SIGNIFICANCE

This practicum concerning cognitive styles and the utilization of cognitive style mapping of students to determine and effectively utilize instructional strategies is appropriate to the Curriculum Development Module in that instructional processes are the actual means whereby implementation of a curriculum takes place.

Theories of learning rooted in associationism and empiricism have been challenged by philosophers, psychologists and educators alike who were opposed to the passive, mechanistic view of man exemplified in the associationistic position and the exclusion of such factors as purpose, interest and wishes from the views of the stimulus-response behaviorist. For the cognitive psychologists, learning consists of much more. Learning is a larger problem of organization. It occurs continually rather than peripherally, involves insight and problem solving and acquires the acquisition of cognitive structures rather than the acquisition of habits (Losak, 1974).

The term cognitive styles is general and encompasses all the individual variations in the cognitive functioning that do not fit the conventional categories of abilities. The educator is most concerned with those individual variations and characteristics that closely tie to educational goals. School personnel are accustomed to dealing with constructs of verbal and numerical ability, achievement motivation, emotional maturity, creativity, leadership, etc. Unlike these constructs, the concepts of cognitive styles have penetrated the educational scene to only a minor degree. There has been an almost total lack of articulation, until about ten to fifteen years ago, between the psychological study of cognition and educational research. Within the last fifteen years major developments have taken place to bring cognitive psychology and education closer together. First, many experimental psychologists have turned their attention to the study of cognitive processes in ways that are directly related to educational issues. Second, there has been an upsurge of studies in cognitive development as inspired by Jean Piaget with efforts being made to match the development stage of the child to the content and method of instruction. Third, there has been a renewal of interest in individual differences (Kogan, 1971).

All of those in the field of education are aware of the difficulties involved in the application of theory. It is one thing to theorize, idealize and dream of the perfect learning situation. It is, yet, another thing to implement innovative strategies resulting in measurable consequences. A desire on the part of those in education--administrators, teachers, etc.--to improve classroom learning is the necessary ingredient to effect change.

A pivot point in effecting change is acceptance of the fact of individual differences. Each learner has his own individual style of learning of "coming to know." The task in education now is to utilize this knowledge of individual learning styles and apply it to the development of instructional strategies, counseling techniques, and placement procedures as well as in all other phases of education.

According to Witkin (1973), since a person's style is more comprehensive, knowledge about it provides a much better basis for anticipating his behavior in other circumstances than any piece of his behavior taken by itself. Personal styles are not inherently desirable or undesirable. They are just ways in which people differ from each other. Styles occur in a variety of combinations and the unique patterns of styles emphasize individuality.

A number of cognitive styles have been identified--reflectiveness versus impulsiveness; complexity versus simplicity; tolerance for unrealistic experiences; and field-dependence-independence or global-analytical.

The personalistic, mutual terms of a cognitive style portrayal are likely to be more meaningful, more comprehensive and less threatening to a person and hence more communicable, more acceptable, and more useful to him, than traditional ability and personality tests or characterizations. For one reason they minimize the value emphasis often inherent in the usual ability approaches. Consistent with the emphasis of a cognitive-

style approach on ways in which people are different and, thus, more or less suitable for given life activities is the growing evidence on differences in academic choices and performance associated with difference in cognitive styles.

With cognitive style, predictions can be based on a cluster of meaningful interrelated characteristics. Characterization by cognitive style is less threatening, thus more acceptable. It is especially good in counseling situations, because people are seen as different, not better or worse, and are shown that there is a place for each person. Another important feature is that cognitive styles focus on nonverbal domains of cognitive functioning.

Risk of suppression of academic aspirations, with the inevitable contribution to a neverending self-fulfilling prophecy, is much less in cognitive style evaluations with the emphasis being on a multidimensional view of intellect. Cognitive style assessments provide data simultaneously about both cognitive and personality characteristics of an individual thus, further reinforcing its usefulness in guidance and evaluation (Witkin, 1973).

Even though the psychology of cognitive styles and its implications are relatively new in the field of education a number of research endeavors have been documented as other research continues. A typical example of the type of research underway in cognitive style studies is a two-year study by Martens (1976) which involved a number of 2-year educational institutions, and others, in the state of New York. Martens addresses such questions as, Is cognitive style a determinate in the types of materials students select?; Does a program for students in cognitive style information improve learning performance?; and Is there an inverse relationship between students' cognitive styles and their performance on written assignments?

According to Dr. Joseph Hill, there are seven Educational Sciences. This practicum dealt with the one entitled "Cognitive Styles of Individuals" and involved the usage of the educational style mapping process as developed by Dr. Hill and his associates.

The Hill definition of cognitive style differs from those developed in psychology. Cognitive Style represents the manner in which an individual seeks meaning from his environment. It is defined as the Cartesian product of four sets: (1) symbols and their meaning (2) cultural determinants (3) modalities of inference and (4) memory-concern. Hill, unlike some of the psychological researchers, believes that the cognitive style of an individual can be augmented by the process of training and education (Martens, 1975).

Dr. Hill and his associates have incorporated his "Educational Sciences" extensively into the academic programs at Oakland Community College, Michigan, and his cognitive style mapping techniques are being utilized in a number of schools and universities.

According to Hill (1976) the Educational Sciences provide a conceptual framework and scientific language for the applied field of knowledge called education. These sciences approach a level of precision similar to that found in medicine, engineering and law. With the development of the Educational Sciences, the solutions of problems and explanations of phenomena are facilitated and educational problems resulting from inadequate communications, misinterpretation of information and fragmentation of effort are alleviated.

Based on Blooms' Mastery for Learning and others, Hill (1976) and Nunney (1975) believe, and put into practice, the contention that 90% of students with normal ability can learn 90% of the material 90% of the time if the teaching methods and media are adjusted to the student's educational cognitive style, that is, personalized instruction. By utilizing the mapping process,

modes of understanding or presentation methods, for the materials to be learned can be matched to the student. Prescription designed to augment areas of weakness shown by the elements of the map can be developed. The two dimensional use of the educational cognitive style map--to prescribe for achievement and to prescribe for augmentation--points out the multiple advantages of knowing one's educational cognitive style and its changing strengths (Nunney, 1975).

By mapping it can be determined which students can and do learn well from the various elements of educational technology be it TV, textbooks, audiotape, etc. The aim is to diagnose the style of the student, determine his strengths and utilize media which will capitalize on his strengths. The mapping process has responded to demands for a more scientific approach to education and has developed a coordinated approach to prescription instruction. Components of the personalized education program are as follows: (1) Diagnostic Testing and Cognitive Mapping; (2) Develop a Personal Educational Prescription; (3) Classroom Presentation of Concepts/Routes to a Prescription Center; (4) Unitized Courses Monitor Achievement through Testing; (5) Modify Prescription to Guarantee Success (Nunney and Hill).

The uses of cognitive style mapping techniques are numerous in the field of education. In addition to those indicated above, some additional ones are cited here. Projects are underway in some schools to match a student's cognitive style with the style indicated by a particular occupation. According to Rosé (1975), the main purpose and intent of learning about the cognitive style required in different occupational areas is to provide a basis for guiding students toward occupational choices which closely match their cognitive styles. Each individual has his own cognitive style and each occupation requires a definite cognitive style by design. In this same vein, Volk (1975) did an exploratory study to determine if there was a typical

cognitive profile of a newly enrolled student which could indicate potential success in a 2-year program of nursing education and also, to determine which symbolic orientation on the cognitive map would indicate areas of strengths and weaknesses which could be used to diagnose and prescribe preparatory studies to increase the percentages of successful students in the class.

Studies by Griffin (1974), Lee (1975), Allsop (1976) and others have combined the cognitive mapping process with other areas such as Human Potential Seminars and Career Counseling to produce comprehensive orientation programs toward self awareness and educational successes.

The mapping process allows for grouping students for better classroom presentations. It is definitely advantageous to know the styles of students in the classroom situation. According to Bodine (1977) all students prefer some structure in classroom situations. Small group sessions can allow students to become accustomed to less and less structure and then generate their own. Bodine suggests, too, that for professional education courses, one should reconsider current grouping methods and not group individuals according to major area of study since similar cognitive styles tend to make similar career choices. According to the task at hand, one should consider mixing groups according to cognitive style for more powerful group work since cognitive style and major tend to co-vary.

Not only can mapping on the basis of the "Educational Sciences" facilitate more effective grouping for instructional purposes, but teachers can readily master the techniques of diagnosing. Empirical mapping of cognitive styles involves a diagnostician in the act of classifying behaviors on a "make sense" or "does not make sense" basis in relation to a well-defined collection of elements--a role similar to the diagnostic activities of the medical doctor. Both direct and indirect measures of the

defined are employed in the diagnosing process. Direct measures are interpretations of behavior derived through direct observation of the subject. Indirect measures are those interpretations derived from related data such as test scores, grades in school, samples of students work, etc. (Schroeder, 1971).

Dunn (1977) indicates an additional advantage to the mapping process by saying that if students were taught according to the results of learning style evaluations, students would not only be more likely to learn but that the number of educational malpractice suits would be decreased. A major premise is that matching cognitive traits and instructional treatments does produce learning gains and this has been substantiated by Elliott (1976) and others. Mountain View College in Dallas, Texas, even publishes the instructional methods of its instructors which are based on each instructor's cognitive style map or otherwise determined delivery methods in the appropriate schools publications so the student can choose the instructor whose teaching methods the student prefers.

A major development in the past two decades has been recognition that individual differences in aptitude not only predict learning outcome but also often interact with instructional treatment variations in so doing. This make adaptive instruction a possibility and even a requirement for educators. It also makes possible the combination of cognitive experimental psychology and cognitive differential psychology much more exciting because it shows that relations among the individual differences can be manipulated by varing treatment conditions. Individual differences can be used by the instructional developer to understand and improve instruction for everyone (Snow, 1977).

According to Saylor and Alexander (1974), the purpose of all curriculum planning is to provide opportunities for an individual student or group to benefit maximally from participation in selected learning activities. As

the student partakes of learning opportunities which become learning experiences the result is personal growth. This is the process of instruction and instruction is the implementation of the curriculum plan.

The Cognitive Style Mapping of students allows the instructor to become aware of the student's own individual way of "coming to know" and allows for the enhancement of the student-teacher relationship. Roueche and Mink (Roueche and Snow, 1977) found a significant relationship between the amount of time that teachers are willing to spend early in the school year in getting involved with students and the amount of content those students were later able to master throughout the year. Good student-teacher rapport is vitally important and human involvement with the learners is a key to getting students motivated and involved in the learning process.

Another study by Hurewitz and Hurewitz (1978) implied that teachers can become more effective by becoming aware of themselves and the importance of their interaction with their students.

Bloom suggests that group study, tutoring, textbooks, workbooks, programmed units, A-V materials and academic games all should be considered since no one of these is ideal for all learners. The aim is to find the best techniques in which the student's abilities interact with the instructional material and the instructor's abilities in teaching (Roueche and Pitman, 1973). Some examples are as follows (Radike, 1973):

1. A student with a major magnitude (M) requires presentations and materials where specific rules and definitions are utilized and mastered as a means to problem-solving and concept acquisition.

2. A student with a major difference (D) requires presentations and materials that provide many opportunities to contrast qualities, shapes,

sizes, or colors for grouping into classifications or caregories. He needs tc see how a concept is different from others, and needs to examine alternative but similar concepts.

3. A student with a theoretical auditory orientation in either words or numbers, T(AL), T(AQ), requires presentations and opportunities for response in this mode.

4. A student with a theoretical visual orientation in either words or numbers, T(VL), T(VQ), requires written presentation and an opportunity for written response.

5. The student with empathy Q(CEM), proxemics Q(CP), and ethics Q(CET) should work well in the small group or peer grouping. The transactional Q(CT) might be expected to exercise group leadership.

6. The student with a major synnoetics Q(CS) or major ethics Q(CET) would be both confident enough with a strong dependability orientation to work by himself.

Instructors should attempt to develop instruction at all levels of cognitive hierarchy-knowledge, comprehension, application, analysis, synthesis and evaluation. Evidence from colleges around the country indicates that colleges and students perform best when individualized instructions is developed to accommodate individual learning styles of the students and their needs (Roueche and Pitman, 1973).

Experience with thousands of instructors indicate that most of them know a great deal about teaching, they just don't get many opportunities to do it (Gordon, 1974).

Teaching effectiveness must be considered in relationship to a particular instructor, dealing with particular learners, in a particular environment, as he attempts to achieve particular instructional goals. Effective instruction should be defined as an ability to bring about desirable

modifications in the abilities and perceptions of the learner. Goal-referenced instruction aids the teacher in the initial selection of instructional activities. Instructors must provide appropriate practice sessions if students are to learn skills (Popham, 1970).

According to Hunter (1977), there are three research based assumptions that undergird the national movement toward individualization.

1. Every student has potential for learning the next thing beyond that which he already knows.

2. Students need different kinds of assistance from and stimulation by the teacher.

3. Students use different modes and strategies for learning.

Teachers need to be concerned with three aspects of each student's learning behavior:

1. What strategies does he use successfully?

2. What does he need to develop or strengthen?

3. What environment will optimize 1 and 2?

Will the student learn better in the most able, the least able or in the middle of the group? Should the group be large or small; with friends or less intimate classmates; under the teacher's eye or independently? All should be taken into account if a program is truly individualized for each student. To have each student working independently is as undividualized as to have all students working as a total group.

A student needs many things among them are help in identifying his academic interests and goals and a course of study aimed at reaching these goals. The course of study should include: (1) the transfer of information; (2) the opportunity and tools for individual study; (3) the opportunity to apply what has been learned through synthesis, extrapolation and so on. The effectiveness of learning situations is influenced by such

factors as: (1) the method of presentation and teaching materials employed; (2) the physical enviornment designed for learning; (3) the aptitude of the individual to learn the material presented; (4) the sociocultural background of the individual; (5) the quantity and quality of the individual's past experiences, and; (6) the motivational climate or the needs and tensions present within the individual (Sleeman and Rockwell, 1976).

As indicated by Sleeman and Rockwell (1976) a research endeavor was conducted using three modes of instruction with three different groups of students, based on the results it was implied that no one mode of instruction is more successful than another in transmitting information to be learned by all students. Therefore, the adoption of individualized instruction and/or the utilization of a variety of instructional modes would enhance learning for students of a wider range of aptitudes. Students with below-average aptitudes performed better when the conventional instructional mode was used which could be attributed to their familiarity with a lecture-textbook arrangement. Therefore, a direct personal approach that increases the chances for dialogue between teacher and students would enhance learning for below-average students, producing a climate more conducive to comprehension. Individual instruction in written form is perhaps most effective for students of average ability. Students with high aptitudes seem to translate information best through audio and visual and would thus profit in learning by the use of these forms.

A review of the literature on Instructional Technology and Methodology, revealed the following instructional strategies: Lectures, Seminars, Independent Study (Self-Instructional), Youth Tutor Youth (YTY), Small Group Discussion, Discussion-Questioning Modes, Practice and Drill Modes, Viewing, Listening and Answering, Problem-Solving, Discovery, Lab and Inquiry Modes, Role-

playing, Simulation and Games, Play, Handling, Manipulating, Acting, Audiotorial, Programmed Instruction and Computer-Assisted Instruction.

In their book entitled Planning Curriculums For Schools, Saylor and Alexander (1974) list the major characteristics of the instructional strategies along with the appropriate groupings, student activities, teacher activities, teaching activities, teaching resources, uses and value and drawbacks and defects.

According to Hyman (1970) there are some commonalities among the strategies. They are:

1. Preparation for instruction - what the teacher does before he confronts the student. This includes gathering materials, making a lesson plan, reviewing notes, and predicting possible student response to his action.

2. Motivation - what the teacher does to capture the attention of the student. This does not include the use of "gimmicks" that capture the student's attention temporarily.

3. Presentation of the learning task - what the teacher offers to the student - what the student is to learn. This is the essence of the teaching act, and it is in the specification of this step that the various teaching methods differ.

4. Inducement of the trial response - what the teacher does or asks the student to do in order to determine whether the student has learned the material or task presented.

5. Correction of the trial response - what the teacher does in order to correct the response of the student. If the trial response shows that the student has learned the material or task, then this step is unnecessary (It is usually necessary.)

6. Fixation of response - what the teacher does to assure that the student retains what he has learned.

7. Test response and evaluation - what the teacher does to determine how well the student has learned the task presented.

As stated by Cohen (1969), any theory of instruction must be concerned primarily with how to arrange environments to optimize learning according to various criteria. Theories of instruction will have to be based on the extent to which alternative instructional strategies cause learning of different concepts among different types of students. Instruction, itself,

is seen as a set of sequences that move learners deliberately, actively and overtly toward the objectives.

One especially significant observation by Cohen (1969) is that the lecture method especially appeals to students who have just enrolled because it allows them to feel as though they are in an "old time" college. Their sense of tradition is upheld.

As indicated by Roueche and Herrscher (1973), which was earlier stated by Glasser in 1969, the contents of each course should be made on the basis of its relevance to the needs of the students and its fulfillment of the purposes of the instruction. Students should be told why they need to master particular material.

Roueche and Herrscher (1973) further indicate that all learning and thus all instruction can be classified into three groups: (1) cognitive (intellectual), (2) affective (feelings and attitudes), and (3) psychomotor (manual skills). Objectives which provide direction and encourage learning can also determine the test questions that are used to provide evidence of learning (behavior change) thus verifying the effectiveness of instruction. Regardless of the approach used, several factors should always be given serious consideration: explicit directions, learning units of appropriate length, frequent practice, knowledge of results, positive reinforcement, appropriate media. The purpose of any instructional program is to produce measurable changes in the students for which it was designed. The kinds of changes to be produced by instructional programs should include change in knowledge, feelings, attitudes and so on.

To summarize, educators must be cognizant of the fact that effectiveness of instructional strategies varies with respect to the individual learning style of the student and continuous efforts must be made to diversify techniques for transmitting knowledge.

PROCEDURES

The mapping process used in this practicum was the one developed by Dr. Joseph Hill (1976). According to Hill (1976) there are seven educational sciences. This project involved the one entitled "Cognitive Styles of Individuals" and utilized the educational cognitive style mapping process as developed by Dr. Hill and his associates.

An educational cognitive style map or "word picture" is drawn from the results of a series of tests. The Interest Inventory, or preference test, was utilized in the procedure. The results of the test are categorized into three main parts or sets. One set indicates the individual's tendency to use certain types of symbols, one's ability to understand words and numbers, qualitative sensory symbols, qualitative programmatic symbols and qualitative codes. Another section deals with the influences which the individual brings to bear in deriving meaning from symbols. These involve one's own individuality, one's associate or one's family. The remaining set indicates the way a person reasons or the way in which one infers, that is, determining if the individual thinks in terms of categories, differences, relationships, or all three. According to Hill, two types of symbols, theoretical (word and numbers) and qualitative (code data) are basic to the acquisition of knowledge and meaning. Theoretical symbols differ from qualitative symbols in that the theortical symbols represent something to the individual that is different from that which the symbols actual are i.e. words and numbers. Qualitative symbols are those symbols which represent to the individual's awareness that which the actual symbol is i.e. feelings, commitments, and values.

There are two main types of theoretical symbols - auditory and visual- each of which is divided into linguistic and qualitative elements. The

theoretical and qualitative symbols are interpreted as follows:

T (VL) - Theoretical Visual Linguistic - visual perception

T (AL) - Theoretical Auditory Linguistic - hearing words

T (VQ) - Theoretical Visual Quantitative - visual perception number

T (AQ) - Theoretical Auditory Quantitative - hearing numbers

Q (A) - Qualitative Auditory - sound other than words

Q (O) - Qualitative Olfactory - smell

Q (S) - Qualitative Savory - taste

Q (T) - Qualitative Tactile - touch

Q (V) - Qualitative Visual - sight other than words

Q (P) - Qualitative Proprioceptive - coordination

Q (CEM) - Qualitative Code Empathic - empathy

Q (CES) - Qualitative Code Esthetic - creative

Q (CET) - Qualitative Code Ethic - commitment to set of values

Q (CH) - Qualitative Code Histronic - staged behavior

Q (CK) - Qualitative Kinesics - body language

Q (CKH) - Qualitative Kinesthetic - motor skills

Q (CP) - Qualitative Proxemics - capacity to judge social distance

Q (CS) - Qualitative Synnoetics - knowledge of oneself

Q (CT) - Qualitative Transactional - leadership

There are three cultural determinants of the meaning of symbols. They are as follows:

I - Individual

F - Family

A - Associates

The third set of the Cartesian product forming the map of cognitive style includes elements which indicate the individual's modality of inference. They are as follows:

M - Magnitude - categorical reasoning

D - Difference - one to one contrast

R - Relationship - multiple input

L - Appraisal - uses all three of the above to analyze

K - Deductive - logical proof

The cognitive styles elements can occur in varying degrees of strength and have been categorized as follows:

0-25 percentile range - negligible

26-49 percentile range - minor

50-99 percentile range - major

As for the validity and reliability of the Cognitive Style Mapping items and elements, documented research provides extremely strong evidence for the reliability and validity of the instrument (Heun), (Volk, 1976). In regard to predictability, it depends greatly upon the ability of the diagnostician to empirically map the style of the individual under consideration in the context, or intended context, of the instructional setting (Volk, 1976).

The feasibility of increasing personalization of instruction by utilizing educational cognitive style mapping has been demonstrated in numerous projects, dissertations and courses. Its acceptance (Volk, 1976) is indicated by the following:

A. Ninety-two doctoral dissertations based on the Educational Cognitive Style Map have been written and accepted as valid. Others are currently being developed.

B. Higher institutions have recognized doctoral work and dissertations based on Educational Cognitive Style Mapping, i.e. Wayne State, Ohio State, Kent State, McGill U., Nova U., Walden U., Flordia Southern U., Marquette U., Penn State, American U., U. of Tennessee, U. of M., and Michigan State.

C. Four institutions give graduate credit for the Educational Sciences based on the Educational Cognitive Style Map, i.e., U. of Oklahoma, Barry College, Vassar, Stevens and Marygrove.

D. Educational Cognitive Style Testing and Maps have been validated by American College Testing and is now being field tested.

E. It is also being used by the U. S. Department of Labor, U. S. Department of Agriculture, and the American Automobile Association.

The Cognitive Style Mapping Interest Inventory has been completed on each instructor in the division and a map was obtained on each new student in the Allied Health Division during fall quarter orientation.

Through the utilization of the cognitive style data, one can begin to interface content with the cognitive style of the individual and assemble students and teachers together in an atomosphere which is mutually satisfying and effective. To personalize instruction, instructors must develop and have available alternative educational methods to match alternative educational cognitive styles. And since cognitive style is not immutable it can be augmented. Missing strengths required for a specific occupation, be it Allied Health or another technology, can be built on a student's existing strengths.

A seminar was sponsored by the college administration last year for the purpose of general orientation to cognitive style mapping techniques and procedures. The meaning of the cognitive style map and its potential usefulness with instructional methods and student relations was discussed at length. The meeting was an important factor in the faculty member's understanding, acceptance and learning of the procedures involved. A question and answer session was included. As noted by Hilgard (1966), Katona indicates that in the learning process, understanding improves retention and promotes transfer of learning. The better an individual is informed, the less anxious and more receptive he will be. At the conclusion of the meeting, the faculty members of the Allied Health

Division expressed a definite interest in the utilization of cognitive style mapping techniques and procedures and indicated their willingness to participate in either a school-wide or division-wide project.

Based primarily on the divisional dean's concern along with clear indications of interest from the Allied Health Division faculty members, project ideas and plans developed. A follow-up meeting for the division was held to further reinforce the learning process concerning mapping and to present the procedure to be followed in the project. At the close of the meeting the Cognitive Style Mapping Interest Inventory and directions for using it were distributed. The faculty members were asked to complete the inventory and return it to the division dean within one week.

The findings were summarized to form a map. The individual faculty members were counseled by the college counselor who has been trained to interpret cognitive style maps. An additional session was held which included the divisional dean who is also receiving training and experience in map interpretation. As a result of these sessions the faculty members were made aware of their own CSM or style of "coming to know" which would in turn allow them to relate more effectively with their students' CSM's.

A final meeting was held to consider the ramification of the project findings and to develop a directional plan toward maximum utilization of the cognitive style map as obtained from instructors and how the utilization of the mapping process could further enhance their teaching effectiveness and the learner's acquisition of knowledge. The faculty was encouraged to learn the symbols and the meanings as used in the mapping process and to begin immediately "empirically" mapping students through observational techniques.

The procedures for this practicum began with a series of In-Service workshops on Cognitive Style Mapping. (See Appendix A.) The workshops

were conducted by the CSM Counselor for the Allied Health Division Faculty. The divisional counselor was included in the CSM workshops to promote communication between the division and the counseling center and to continue to familiarize the divisional counselor with Cognitive Style Mapping procedures. The workshop involved learning (or refreshing) of CSM concepts, CSM diagnosing and prescribing and a practical session using the maps of the new students. Cognitve Style Maps on all the new students in the Allied Health Division were obtained during fall quarter orientation. A total of one hundred and thirty (130) students were tested. The departments in the Allied Health Division are Radiologic Technology, Medical Laboratory Technology, Dental Assisting, Surgical Technology, Ward Secretary and Child Care Assisting. After the students were mapped, they had individual advising and counseling sessions with the faculty members to discuss their maps and its significance to their learning endeavors. In addition, a series of workshops were conducted for the faculty on Instructional Delivery Methods and Utilization. (See Appendix B.) The first session of the series reviewed the Types and Levels of Learning and CSM and Instructional Strategies. (See Appendix C.) Two sessions in the series involved instructional technology including the procedures of producing video-tapes and the preparation of other types of instructional materials.

To conclude the project, the faculty members of each deparment met with the divisional dean to discuss student maps and general CSM configurations of the various classes. The effective utilization of the most appropriate instructional delivery methods were discussed and plans were made to begin preparing alternative delivery methods which would meet the needs of the individual students within a class or within a classroom cluster which is made up of students with similar styles of "coming to know."

Also, during the departmental sessions with the divisional dean, each departmental faculty presented a CSM profile of the students in their department (see Appendix D), diagnosing and prescriptions for each student and then, with the assistance of the divisional dean, developed recommendations and implementation plans for changes in instructional delivery strategies as indicated. (See Appendix E.) A listing of the instructional methods and materials presently in use within each department was collated.

A follow-up meeting was held between the divisional dean and the CSM counselor to review the diagnoses, prescriptions, utilization plans for the alternative instructional strategies and to evaluate the project results in general. The College President and the Vice President for Academic Affairs were kept abreast of the project and were informed concerning the project expectations, results and recommendations.

RESULTS

An educational cognitive style map was obtained on all new students of the Allied Health Division during fall quarter orientation. The CSM Interest Inventory was administered to a total of one hundred and thirty students in the programs of the division which included Radiologic Technology, Medical Laboratory Technology, Surgical Technology, Dental Assisting, Ward Secretary and Child Care Assisting. All categories of the inventory were determined on each individual and indicated on an individual profile sheet.

The faculty members of the Allied Health Division, equipped with the maps of their students, diagnosed the learning styles of the students as indicated on the inventories and then proceeded to prescribe instructional strategies and teachning techniques which would best suit the learning

styles of the individual students.

During the first week of the fall quarter, the faculty had advising-counseling sessions with each student to discuss the mapping process, the student's own map and the implication which the map had toward the student's learning style. The faculty retained the maps which they used throughout the quarter during additional advising sessions. They will continue to use the maps throughout the year to assist students in taking advantage of their learning strengths and in making efforts to augment weaker areas.

The faculty had previously participated in workshops concerning CSM Concepts, CSM Diagnosing and Prescription Writing, Utilization of Alternative Instructional Strategies, Instructional Methodology and Instructional Technology. (See Appendices A, B, and C.)

The faculty members presented, in writing, CSM Class Profiles to the division dean. (See Appendix D.) During departmental sessions with the dean, the profiles were discussed. The faculty indicated the instructional strategies which they were presently utilizing. The listing of instructional strategies and methods was developed for each department along with plans for the enhancement and future utilization of alternative instructional strategies and materials. (See Appendices E and F.)

During the departmental session with the deans, the maps and profiles were discussed at length. Each department head elaborated on the findings of the class profiles. Some of the general findings are indicated below with specifics shown in appendix D.

The Medical Laboratory Technology Department CSM Class Profile indicated that the class as a whole preferred to listen to lectures as opposed to reading as a means of learning. To accomodate this preference the instructors include lectures and audio-tapes of lectures while encouraging specific

individuals to bring recorder to class when that person needed to have information repeated several times. Those who scored low on T (AL) were encouraged to practice listening more to lectures even if it requires a special effort on their part. The majority of the class expressed a dislike for mathematics. Most of the students scored high on Q (CEM) - empathy and Q (CET) - ethics. The Modalities of Inference area indicated that most of the MLT students require structure and organization in their decision-making processes.

The Radiologic Technology CSM Class Profile indicated that sixty-five percent learn best through visual methods rather than through auditory means. In reviewing the students' cultural determinants, fifty-two percent were major I - independent with thirty-five percent being major A - associates.

A large percentage of the Dental Assistant students seemed to prefer to learn by the seminar method. The maps indicated that some of the students needed to develop a professional image and to learn to become more authoritative. Many of the Dental Assistant students were major I - independent.

The Surgical Technology CSM Class Profile indicated that a majority (fifteen out of eighteen) scored a major T (AL) and a major T (VL), that is, they "come to know" both through hearing and seeing words. All eighteen scored a major Q (CEM) - empathy. A majority scored a major Q (CET) - ethics. Sixteen of the eighteen scored a major M - magnitude, that is they like structure, rules and regulations in their decision-making processes.

Most of the Child Care Assistant students scored major in T (AL) and T (VL). Fifty percent of the class scored a minor in role-playing. Over ninety percent of the class was major I - independent.

The Ward Secretary CSM Class Profile indicated that the majority of the students scored a major T (AL), T (VL) and T (VQ). A majority scored a major Q (CEM).

In addition to obtaining actual cognitive style maps on the individual students, diagnosing and prescribing for personalized instruction, and reviewing present strategies and planning for the future utilization of alternative instructional strategies, a number of positive feelings and tangent plans evolved from the project both within the division and throughout the college.

DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

According to Cross (1974) cognitive style permits both students and teachers maximum opportunity to develop the teaching/learning styles that are most effective for them. She sees the present emphasis in cognitive styles as especially welcome in education while directing efforts toward accepting individual differences as a challenge.

The feasibility of increasing teaching effectiveness and personalization of instruction utilizing educational cognitive style mapping has been demonstrated in numerous projects, dissertations and courses. In order for cognitive style mapping procedures to be completely effective in any particular educational situation, the involvement and commitment of both administration and faculty are necessary prerequisites. Administration and faculty should begin by determining their own educational cognitive style. Through the mapping process, one becomes familiar with the terminology, procedures and usages.

With the mapping process, the dissonance between teacher style and student style can be understood and allowance can be made when necessary. The student can be placed in a learning situation that is best fitted to

his style of "coming to know." More appropriate and desirable career choices can be made on the basis of the mapping information. Often the pressures in the educational process make measurement and other aids to student's planning an emergency, last-minute exercise when decisions must be made. It is far more efficient to anticipate some choice points with a time margin (Davis 1971). Such a time margin can be made possible when instructor and student maps are obtained far enough in advance to make wise decisions concerning instructional strategy and career or course choices. With adequate information at the appropriate time, one's learning style can be diagnosed followed by a prescription of the most productive learning situations. Cognitive style maps should be useful to both those who give guidance to others and to those who seek to understand themselves better.

After being involved in workshops on Cognitive Style Mapping Concepts, Diagnosing and Prescribing, Instructional Methodology and Technology the faculty members of the Allied Health Division were in a position to effectively use students maps to determine instructional strategies. Since the faculty members were already aware of their own maps they could further enhance the effectiveness of the mapping process as they made efforts to understand and eliminate any incongruency between themselves and their students.

The faculty members had individual advising-counseling sessions with each of the students to interpret their maps and its relationship to their learning processes and particular way of "coming to know."

During the interpretation process several points were kept in mind and should always be considered (Radike, 1973):

1. The three sets, symbols, determinates, inferences, must always be considered together since they are functions of each other.

2. All of the elements within a set should be considered together. Instructors must resist the temptation to seize on any element as an isolated strength or weakness but instead consider the "whole" person.

3. The map is not an end in itself but a means of diagnosing.

4. The map is not static but changeable. It is only valid for a particular point in time.

5. The map is only one of three facets to be considered in providing personalized instruction. The other factors involved are the mode of understanding required of the educational task and the congitive style of the teacher with whom the individual will interact.

The Educational Scientist (Fall 1975) appropriately summarized the Cognitive Style Mapping process and its relationship to the design of an educational system.

1. Educational cognitive style maps can be generated for all students.

2. Different mapping techniques have to be used for different students, largely dependent on their level of educational development and the context in which the mapping is affected.

3. Analysis of the educational cognitive style maps must precede the design of the educational process to be followed.

4. A group of 30 students requires at least 5 or 6 alternative prescriptions.

5. A one-prescription system is rarely successful for all students involved.

6. Teacher-aides, peer-tutors, and volunteers can be matched with a student's cognitive style.

7. The teacher's role varies from diagnostician, to prescriptionist, to educational process designer.

8. Case studies on individual students must be developed in order to assess the efficiency of the prescription and the potential need for change.

9. Augmentation of elements at any age level is possible but the amount of time needed depends upon the element being augmented, the level of educational development, the degree of motivation, and the establishment of realistic performance goals.

The major implication of this practicum with respect to the students, faculty and college is exemplified by the fact that Cognitive Style Mapping provides a means of determining the most effective instructional approach to assure the personalization of instruction and the development of instructional strategies.

A number of positive recommendations naturally result from a project which has proven to be effective and well accepted by all of the participants.

Within the division, it is recommended that the Cognitive Style Maps of the present students be utilized throughout the year to allow the instructors to provide the most appropriate learning situations for each student and to continue to use the individual maps to enhance the effectiveness of counseling-advising sessions.

Exit maps should be obtained on the present students to help determine what changes have taken place , if any augmentation has occurred and to what extent, and to allow further studies to take place which could possible improve the CSM - alternative Instructional Strategies processes.

Faculty members of the Allied Health Division should continue to use CSM terminology and concepts on a daily basis so as to improve their abilities in diagnosing and prescribing.

Faculty members should make every effort to implement the plans that have been developed for enhancement and future utilization of alternative instructional strategies and materials.

Efforts should be made to effectively tie together the properties of the Affective Domain with the Cognitive Domain to further enhance the student-teacher relationship and the teaching-learning effectiveness of the instructional strategies.

The college administration and faculty should begin immediately to develop and implement a school-wide course of action that includes faculty and administration mapping, student mapping, counseling procedures, and preparation of a variety of instructional delivery methods in each area so as to comply with the different cognitive style needs of the student. Also, it would be valuable to the college for administration to know each faculty member's learning style so as to be able to present all matters in a more effective and productive manner and to enhance rapport among all areas.

Finally, it is recommended that the usage of CSM and the utilization of alternative Instructional Strategies along with the measurement of student achievement of specific learning objectives be investigated as a possible means of evaluating instructor effectiveness.

REFERENCES

Allsop, Ginger, et. al.. "A Practical Implementation of the Educational Sciences at Polk Community College, Florida," The Educational Scientist.

Berg, Ernest H.. "Curriculum Development and Instruction: A Proposal for Reorganization," Student Development Programs in the Community Junior College. New Jersey: Prentice-Hall Inc., 1972.

Bodine, Robert L.. "The Effects of Cognitive Style, Task Structure, and Task Setting in Student Outcomes - Cognitive and Affective,: A paper presented at the annual meeting of the American Educational Research Association, New York, April, 1977.

Cohen, Arthur M.. Dateline '79: Heretical Concepts for the Community College. California: Glenco Press, 1969.

Cross, K. Patricia.. "The Elusive Goal of Educational Equality." Speech presented at the annual meeting of the American Council on Education, San Diego, October, 1974.

Davis, J. A.. "Use of Measurement in Student Planning and Guidance," Educational Measurements (2nd ed.). Washington, D.C.: American Council on Education. 1971.

Dunn, Rita. "Diagnosing Learning Styles: A Prescription for Avoiding Malpractice Suits," Phi Delta Kappan. 1977, 58.5; 418-420.

Elliot, Charles A.. "The Effects of Instructional Designs. Matched to Individual Differences in Cognitive Styles on Concept Learning: A Trait - Treatment Interaction Study." A paper presented at the Annual Meeting of the American Educational Research Association, April, 1976.

Glasser, William. Schools Without Failure. New York: Harper and Row, 1969.

Gordon, Thomas. Teacher Effectiveness Training. New York: Peter H. Uryden, 1974.

Griffin, Thomas E.. "Preferred Learning Styles: A Design for Future Curriculum." Ed. D. Practicum, Nova University, 1974.

Herrscher, Barton R.. Implementing Individualized Instruction. Statesville, N. C., 1971.

Heun, Richard E. et. al.. Edumetric Validation of Cognitive Style Map Items and Elements: I. Northeast Missouri State University.

Hilgard, Ernest R. and Bower, G. H.. Theories of Learning (3rd ed.). New York: Appleton-Century-Crofts, 1966.

Hill, Joseph.. The Educational Sciences. Bloomfield Hills, Michigan: Oakland Community College Press, 1976.

Hunter, Madeline. "A Tri-Dimensional Approach to Individualization," The Education Digest. September, 1977.

Hurewitz, Carol and Paul Hurewitz. "Teacher Relationships to Cognitive and/or Affective Learning," Improving College and University Teaching. Spring, 1978.

Hyman, Ronald T.. Ways of Teaching. New York: J. B. Lippincott, Co., 1970.

Kogan, Nathan. "Educational Implications of Cognitive Style," Psychology and Educational Practice. Illinois: Scott, Foresman and Company, 1971.

Labouire-Vief, Gisela, Joel R. Levin and Kathryn A. Urberg. "The Relationship Between Selected Cognitive Abilities and Learning: A Second Look," Journal of Educational Psychology. 1975, 67, 4; 558-569.

Lee, Owen M. Jr.. "The Development of a Model for the Management of a Student - Centered Program at a Community College Utilizing Human Potential Seminars, Cognitive Style Mapping, and Career Planning." Doctoral dissertation, Nova University, 1975.

Losak, John. Learning Theory and Applications. Nova University, 1974.

Marjoribanks, Keven. "School Attitudes, Cognitive Ability, and Academic Achievement," Journal of Educational Psychology. 1976, 68, 6; 653-660.

Martens, Kay, Ed.. "Critical Questions: A Report of the Projects Utilizing Cognitive Style Information in New York State Two-year Colleges, Project Priority: Occupational Emphasis." August, 1976.

Mountain View College. "Classroom Utilization of Cognitive Style Mapping." Dallas, Texas. October, 1977.

Nunney, Derek E. and Joseph E. Hill. Personalized Educational Programs. Bloomfield Hills, Michigan. Oakland Community College.

Nunney, Derek E.. Educational Cognitive Style: A Basis For Personalizing Instruction. Bloomfield Hills, Michigan, Oakland Community College, 1975.

Popham, James W. and Eva L. Baker. Systematic Instruction. New Jersey: Prentice-Hall, Inc., 1970.

Radike, Floyd W. (Ed.) Handbook for Teacher Improvement Utilizing The Educational Sciences. American Educational Sciences Association. June, 1973.

Rohwer, William D., Jr.. "Cognitive Development and Education," Carmichael's Manual of Child Psychology. 1970, 3rd edition, Volume I: 1379-1445.

Roueche, John E. and Barton R. Herrscher. Toward Instructional Accountability. California: Westinghouse Learning Press, 1973.

Roueche, John E. and John C. Pitman. A Modest Proposal Students Can Learn. San Francisco: Jossey-Bass, 1973.

Roueche, John E. and Jerry J. Snow. Overcoming Learning Problems. San Francisco: Jossey-Bass, 1977.

Rose, Bill and John C. Xenos. "Utilizing the Educational Sciences Cognitive Style Matching Concepts of the Student, Teacher, Program Area and Occupation to Advise and Counsel Students in Vocational/ Career Areas." Oakland Community College, Bloomfield Hills, Michigan. November, 1975.

Saylor, J. Galen and William M. Alexander. Planning Curriculum for Schools. Holt, Rinehart and Winston, Inc., 1974.

Schroeder, Arlen V.. "Cognitive Style: The Key to Student Placement?" Oakland Community College Press. 1971.

Sleeman, Phillip J. and D. M. Rockwell (ed). Instructional Media and Technology. Halsted Press, 1976.

Snow, Richard E.. Individualized Differences, Instructional Theory and Instructional Design. Technical Report No. 4. Office of Naval Research, Arlington, Virginia, June, 1977.

Solomon, Roger Brumley. A Different Drummer, The CCC* College. Georgia: Life Long Learning Library, 1976.

Stevenson, Harold W., et. al.. "Longitudinal Study of Individual Differences in Cognitive Development and Scholastic Achievement," Journal of Educational Psychology. 1976, 68, 4: 377-400.

The Educational Scientist. American Educational Sciences Association. Vol. I, No. I. Michigan, Fall 1975.

Volk, Thomas. "Memo-Educational Cognitive Style Mapping," Oakland Community College - Highland Lakes Campus, Michigan. October 26, 1976.

Volk, Thomas. "The Typical Cognitive Profiel of the Entering Student of Nursing who Succeeds in the Two Year Nursing Program at a Selected Community College: An Exploratory Study," Doctoral dissertation, Walden University, 1975.

Witkin, Herman. "A Cognitive-Style Perspective on Evaulation and Guidance," Paper presented at the Institutional Conference on Testing Problems, New York, New York, November, 1973.

Appendix A (a schedule of workshops and orientations) has been deleted prior to the document's being shipped to the ERIC Document Reproduction Service.

APPENDIX B

ALLIED HEALTH DIVISION

CSM AND INSTRUCTIONAL STRATEGIES SCHEDULE

OCTOBER - NOVEMBER 1978

OCTOBER 18, 1978 — CSM and Utilization of Alternative Instructional Strategies Room B-3
12 Noon - 1 PM

OCTOBER 19, 1978 — Video-Taping Techniques
Room B-3 3 PM - 4 PM

OCTOBER 23, 1978 — To Central Piedmont Community College to view utilization of CSM and Instructional Delivery Methods 10 AM - 3 PM

OCTOBER 26, 1978 — Effective Utilization of A-V materials and Equipment with Instructional Delivery Methods
Room B-3 2:30 PM - 4 PM

OCTOBER 24 - NOVEMBER 2, 1978 — Departmental Sessions (Office A-36)

	DATE	TIME
CCA	Nov. 2	2 PM
DA	Oct. 27	1 PM
MLT	Oct. 26	3 PM
ORT	Oct. 30	3 PM
RT	Oct. 31	9 AM
NS	Nov. 1	3 PM

NOVEMBER 3, 1978 — Meeting of Divisional Dean and CSM Counselor
A-36 9:30 AM

APPENDIX C

ALLIED HEALTH DIVISION

INSTRUCTIONAL STRATEGIES SESSION

OCTOBER 18, 1978

I. Types and Levels of Learning

II. CSM and Instructional Strategies

- A. Need
- B. Commonalities of Methods
- C. Types of Strategies
- D. Resourses and Matching

III. List of Cassettes and Filmstrips on Instructional Strategies

IV. Schedule of Activities and Departmental Sessions

APPENDIX D

RADIOLOGIC TECHNOLOGY PROGRAM
COGNITIVE STYLE MAPPING CLASS PROFILE 1978-1979

Because the purpose of the Cognitive Style Mapping is to find the ways in which the student learns rather than his ability to learn, we have reviewed the twenty-eight students' cognitive maps in the Radiologic Technology program in hopes that it would enlighten our teaching methods.

In our study we found that 65% of this class learn best through visual methods rather than through auditory means. Of the students who do learn through auditory means only two of them are strongly auditory. Because of this we have incorporated into our classroom the use of a number of visual aids. For example, many slide-tape presentations have been utilized in the Introduction to Radiologic Technology and Nursing Procedures for the Radiologic Technologist classes. Most of these presentations were acquired from the Allied Health Division although several were borrowed from Spartanburg General Hospital. Study sheets were constructed for several of these presentations since not all items were discussed in the textbooks. A slide-tape presentation was constructed for the Contrast Media class which is used in addition to lecture technique. Several video-tapes pertaining to the Radiology field have been viewed. The over-head projector has been used as a visual aid when listing significant dates and numbers since the Cognitive Style Maps have shown that the majority of the students may have difficulty with numbers. Handouts corresponding to the textbooks have also been constructed.

In reviewing the students' cultural determinants we find that 52% of this class are independent and 35% are influenced by peers. Only 13% are significantly influenced by the family scene. Because the students are so highly independent and peer-influenced, self-paced programs are very helpful. The students are able to move at their own pace and can also

receive aid from their friends. Because of this the self-paced program along with the lecture method of Anatomy are very valuable. This is also utilized in Radiation Protection as well as Physics.

Another advantage for the peer-influence group is that with the use of slide-tape presentations the students are encouraged to review these presentations with friends during their leisure time. At this time the projector can be stopped whenever a question arises.

Because we have a large number of students who are peer-associated as well as visually oriented, many of the procedures discussed in Nursing Procedures have been incorporated into a lab where each student has the opportunity to work with a peer or alone.

The students have been encouraged to utilize the library for completing assignments and current event readings. This encourages the students influenced by peers and family to study with a group. It also encourages the independent student and motivates him to read on his own.

We plan to continue the development of independent studies and the visually-oriented classes in the future. Because we have a number of audio-visual aides already in the division and in our own department, it should not be difficult to accomplish. We might consider developing or purchasing even more of these types of aides.

Richard Meeks
Department Head
October 1978

APPENDIX D

MEDICAL LABORATORY TECHNICIAN PROGRAM

COGNITIVE STYLE MAPPING CLASS PROFILE

1978-1979

T(AQ), T(AL), T(VQ), T(VL) - 9 listeners, 6 readers, 7 whose scores are about the same on both listening and reading. The class as a whole prefers listening to lectures, as opposed to reading, to learn new information. To accomodate their style, we include lectures and audio-tapes of the lectures along with encouraging specific individuals to bring recorders to class when particular students need to have information repeated several times. We have also advised those readers who scored low on T(AL) to practice listening more to lectures even if it requires a special effort on their part. Reading material is assigned also for those who learn best from the textbook.

The majority of the class expressed a dislike for math but their scores also indicate that they need to see the math written down. Toward this end, Mrs. Byrd uses the blackboard in class to work all problems (no matter how simple) and is using assignment sheets and exercise sheets with some problems solved and others for the students to practice solving.

The class scores on Q(P) are high enough to indicate that none of the students should have a problem with laboratory work which involves following a procedure while actually testing a specimen (Doing more than one thing at the same time).

Fifteen students scored high on empathy, seven have minor scores, two of which were very low. The students scoring above thirty-six on empathy were cautioned not to be overly sympathetic with patients and those scoring extremely low were encouraged to become more aware of the feelings of others. One student who scored forty on empathy has already experienced some difficulty performing venipuncture and fingersticks. (She passes out when she is stuck and when she sticks someone else.) Role playing is used to help students learn to deal with patients and other hospital personnel.

Although eight students scored majors in role playing, eleven have minor scores and three negligible scores which indicates that some of the students don't care to play a role. Role playing in class will also help augment their styles in this area. Although this quality is not listed as an essential for our program, we do see the necessity of our students playing a role with patients, fellow employees, and other hospital personnel. We will further emphasize role playing at various times during the year when we discuss how to approach the patient and the importance of the hierarchy of hospital personnel.

All of our students except one scored high on Q(CKH) so they should have no problems repeating test procedures until they are accurate. We have discussed the score of the student who tends to quit early emphasizing the importance of accuracy in laboratory work which sometimes requires repeating the same proceduring to attain proficiency and accuracy.

Q(S) (all students scored majors except one who scored a minor.) The students seem to know themselves very well with two exceptions who will need extra encouragement when their self confidence is particularly low. One of these students does well academically but almost constantly seeks instructor approval before doing any task. She is always the last person to finish a test and must always ask questions about the test to make sure she has interpreted the meaning of each question correctly.

Our students scored majors on Q(CTM) - time expectations.

The class scores varies on Cultural determinants. Twelve appear to be strongly independent, eight are more family oriented and six tend to depend on associates when making decisions. Older students who are married or living away from their parents seem to be more independent while younger students just out of high school and still living with their parents tend to be family and associate oriented. Those students with major I's probably are better suited for the MLT program since technicians work alone in the lab to a great extent. However, we also pointed out to these students that there are supervisors, pathologists, and other lab tech. that they must occasionally consult so they must be able to handle associate interactions also. Those who have stronger associate or family dependence were encouraged to perform their lab work individually and refrain from asking each other questions and depending on each other in lab as much as possible. We encouraged them to come to the instructors if there is a problem understanding assignments or activities. We have also found that the family oriented students especially need interaction with the instructor and one of our plans is to be available to these students to help them but to also teach them to become less dependent on "parent figures" by helping them to make their own decisions.

Modalities of Inference

Three appear to be true L's; they utilize rules and definitions (M), differences (D), and (R) likenesses to analyze information to arrive at a decision rather quickly.

Eighteen student scored highest on M, R & L but also scored in the minor range on D. Our observations this quarter of these individuals indicates they require more time to make decisions and require more examples and repetition of material to grasp meaning and come to a conclusion.

One student scores highest on M and L and seems to have difficulty understanding material possibly because she doesn't use differences and comparisons to relate information. She may possibly memorize facts since she is generally unable to answer review questions or use rules and definitions where applicable in decision making.

Most of the students require structure and organization to make decisions. Some of the ways of providing this structure include emphasizing definitions and rules when teaching new material, giving handouts of step by step procedures for laboratory work, and attempting to outline a definite series of steps (or thought patterns) to analyze word problems in math to help solve

for unknowns. Each problem, however, must be treated in a slightly different manner and they don't all have a formula to make the calculations easier, consequently the majority of the class is not performing well in laboratory math. If there is a formula (set way of calculating results) the class as a whole does not have as many problems. They also seem to have problems analyzing the information given in the stated word problems. To quote a student "I don't have any idea what to do first because I don't know what is being asked in the problem."

The one student who is a mathematical L takes forever to make a decision. She does well academically but must have lots of examples and always has lot of questions to ask before deciding anything. Once she's satisfied with the answers she has given, she passes the test in but invariably she is the last student to finish and has taken more than the allowed time.

Betty Jo Thompson

Betty Jo Thompson
Department Head
October 1978

APPENDIX D

DENTAL ASSISTANT PROGRAM

COGNITIVE STYLE MAPPING CLASS PROFILE

1978-1979

The largest percentage of Dental Assistant Students seem to prefer to learn by the seminar method. Most of them prefer the seminar be faculty led.

These students need to develop a professional image and learn to become more authoritative.

Many of the students should be able to progress through independent study.

Some of the students will need constant encouragement to insure their practice of skills.

Audrey Anderson
Department Head
October 1978

APPENDIX D

SURGICAL TECHNOLOGY PROGRAM
COGNITIVE STYLE MAPPING CLASS PROFILE

1978-1979

In this class profile, I am only going over the symbols which are important to this program.

The majority of students (15 out of 18) scored a major T(AL) and a major T(VL). They are able to gain meaning through both hearing and seeing words. When empirically mapping the students they felt they preferred hearing the material first and then being able to read it. The majority said that reading the material prior to class helped them a small amount, but going over the material orally in class made the meaning more clear. There were only 3 minor T(AL)'s and 3 minor T(VL)'s. The minor T(VL)'s stated they could gain meaning through seeing words, but did not enjoy reading. One student recently discovered that she needed glasses because when she read for long periods she had headaches. She told me that she felt this was probably the reason she disliked reading so much.

Twelve out of eighteen scored a major Q(P). Many were able to type or perform other tasks which required performing two motor skills at a time. Several students had worked in jobs which required these same skills. Of the six that scored a minor on this, only one felt that she might have trouble working with her hands and doing two skills at once. Extra practice time will need to be allowed.

All eighteen scored a major Q(CEM). Each student saw the importance of empathy when working with patients. They also realized that empathy had to stop at a point and that it may be necessary at times to step back and not become emotionally involved. It is also necessary to be able to put on a mask and hide your feelings occasionally. Only eight students scored a major O(CH). When empirically mapping the ten students that scored a minor on this, they felt they would be able to play a role when it was necessary, but they preferred not to.

Sixteen of eighteen scored a major Q (CET). The two that scored a minor on this stated they were committed to a set of values when they could see their importance as in the OR or in school.

Eleven of eighteen scored a major Q (CK). This will need to be augmented in the others, because this is important in understanding patient's true feelings.

Fourteen of eighteen scored a major Q (CKH). If given a task to complete, they felt they would finish it and would have practiced until it was correct. The four minors felt that if a task was important they would finish it correctly. Of these four two had quit school before they finished with their programs. These students will need extra encouragement.

Fourteen of eighteen scored a major Q (CP). Judging acceptable social distance is necessary in working with patients, doctors and other professionals. This will need to be augmented when discussing professional ethics.

Sixteen of eighteen scored a major Q (CS). The two minors were very young students who seemed to lack self confidence. These students will need extra encouragement.

APPENDIX D

SURGICAL TECHNOLOGY PROGRAM
COGNITIVE STYLE MAPPING CLASS PROFILE
(continued)

Sixteen of eighteen scored a major Q(CTM). The two minors said that it didn't bother them to be late for certain things, but realized the importance of being at work or school on time.

Eleven of eighteen scored a major A. They enjoyed working with groups especially peers and were influenced by peers. Most scored a major I also and felt they were able to make decisions on their own without consulting peers.

Fourteen of eighteen scored a major F. They stated they enjoyed teacher led activities.

Sixteen of eighteen scored a major I.

Sixteen of eighteen scored a major M. They liked structure, rules and regulations when making decisions.

Six of eighteen scored a major D.

Thirteen of eighteen scored a major R. They enjoyed examples when learning new material.

Only four were true L's. In class, they always want to know more about what we are discussing.

Thirteen of eighteen scored a major K.

Emily Rogers
Department Head
October 1978

APPENDIX D

CHILD CARE ASSISTANT PROGRAM

COGNITIVE STYLE MAPPING CLASS PROFILE

1978-1979

Due to the Cognitive Style Maps, I found most of the students in CCA were major in T(AL) and T(VL). For this, I used lectures, handouts, the board and the overhead projector in enhancing this style.

About 50% of the class is minor in playing a role. I will make better use of role playing next quarter by role playing examples of behavior experiences in class.

Over 90% of the class is very strong in the independent area. I had questions for students to answer and reports to be made this quarter to help those who were independent.

Pat Voelker

Pat Voelker
Department Head
October 1978

APPENDIX D

WARD SECRETARY PROGRAM

COGNITIVE STYLE MAPPING CLASS PROFILE
1978-79

The majority of the students in this group scored major on T(AL) (14 out of 6) but a minor T(AQ) 8 of 12. The very same spread was demonstrated in the T(VL) and T(VQ). All but two students scored a major Q(V). Only 8 out of 20 scored a major Q(P).

I gather from the above that most of the students would profit by lectures or tapes along with slides, filmstrips or transparencies.

Thirteen out of twenty students scored a major Q(CEM). Empathy, being as important as it is in the health field, will need to be augmented for the seven who scored minor on this.

Only four minors on Q(CET); but we'll need to augment this. Sixteen scored major on Q(CET).

There were 6 majors and 14 minors on Q(CH). This too will need augmentation. Role playing is sometimes very necessary. The majority (12) scored a minor on Q(CK). Nonverbal communication skills will be augmented here.

Of the 20 students 9 scored major (A), 11 major (F) and 16 major (I). In the classroom situation I have not seen the (I) demontrated in but 1 or 2 students. 16 of the 20 are major (M), 13 major (D), 12 major (R), and 15 major (L).

Gladys Hudgens
Department Head
October 1978

APPENDIX E

MEDICAL LABORATORY TECHNICIAN PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Continue to refine and tape lectures along with worksheets

Develop independent study packages (i.e. Lab Math)

Utilize more YTY

Utilize more small group discussion

Strengthen usages of transparencies

Do more role-playing activities

Develop additional games

Develop different types of test in all possible areas

APPENDIX E

RADIOLOGIC TECHNOLOGY PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Develop YTY process and procedures

Have students participate in lecture and text development

Develop additional video-tapes

Tape lecture with worksheets, diagrams, etc.

Develop role-playing activities

Develop more games (password; crossword puzzles etc.)

Develop different types of test in all possible areas

APPENDIX E

DENTAL ASSISTING PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF
ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Increase role-playing activities

Develop additional individualized packages (i.e. Ethics; Office Management)

Develop additional 35 mm slides

Tape lectures and prepare worksheets

Develop "Questioning Technique" procedures

Develop additional games

Develop and further utilize video-taping

Develop different types of test in all possible areas

APPENDIX E

SURGICAL TECHNOLOGY PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Tape lectures with worksheets and diagrams

Expand role-playing activities

Video-taping of demonstrations

Video-taping of student activities for critique

Develop Independent Study Units and Packages

Develop tapes to be used with independent units

Develop additional games

Plan for more group discussion activities

Develop different types of test in all possible areas

APPENDIX E

CHILD CARE ASSISTANT PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Develop "Questioning Technique" procedures

Use small group discussion

Tape lectures with worksheets

Develop independent study units in courses where feasible

Develop additional transparencies

Video-tape special activities

Develop YTY process and procedures

Do more role-playing activities

Develop and utilize more 35 mm slides

Develop different types of test in all possible areas

Develop case studies

Make Charts

Develop games

APPENDIX E

WARD SECRETARY PROGRAM

PLANS FOR ENHANCEMENT AND FUTURE UTILIZATION OF ALTERNATIVE INSTRUCTIONAL STRATEGIES AND MATERIALS

Develop more lecture tapes with text and diagrams

Develop games

Video-tape lectures, demonstrations, etc.

Increase role-playing activities

APPENDIX F

MEDICAL LABORATORY TECHNICIAN PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lectures

Role Playing

Programmed Texts

Taped Lectures

Field Trips

Demonstrations

Manipulative Practice

Tutoring (Instrutor)

Youth Tutor Youth (YTY)

Gaming

Small Group Seminars

Case Studies

Problem Solving

Instrumentation

Independent Study Units

Discussion

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

Transparencies

16 mm Films

35 mm Slides

Tapes

Filmstrips

8 mm Cartridges

Taped Lectures with Handouts (scripts)
(Look, Listen, Learn Series)

Specimen Slides

Wet Specimen Preparations

Instruments

Laboratory Equipment

Course Objectives, Outlines, etc.

Blackboard

Textbooks

APPENDIX F

RADIOLOGIC TECHNOLOGY PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lectures

Independent Study Packages

Demonstrations

Small Group Discussion

Student Oral Reports

Role Playing

Gaming

Questioning Techniques

Case Studies

Extensive Audio-Tutorial Packages

Manipulative Practice

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

35 mm Slides

Tapes

Course Objectives, Outlines, etc.

Radiologic Technology Equipment and Instruments

Charts

Video-tapes

Flash Cards

Blackboard

Textbooks

APPENDIX F

DENTAL ASSISTING PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lectures

Individualized Packages (Units)

Individualization (Personalization) in Operatories

Group Seminars (small group)

Youth Tutor Youth (YTY)

Gaming

Role Playing

Demonstrations

Manipulative Practice

Field Trips

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

Transparencies

35 mm Slides

16 mm Films

Charts

Checklist for Laboratory Performance

Models

Games

Video-tapes

Instruments

Dental Equipment

Course Objectives, Outlines, etc.

Blackboard

Textbooks

APPENDIX F

SURGICAL TECHNOLOGY PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lectures

Demonstrations

Group Seminars

Discussion

Youth Tutor Youth (YTY)

Role Playing

Oral Reports

Manipulative Practice

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

Transparencies

16 mm Films

35 mm Slides

Filmstrips

Tapes

Worksheets

Instruments

Charts

Surgical Equipment

Course Outlines, Objectives, etc.

Blackboard

Textbooks

APPENDIX F

CHILD CARE ASSISTANT PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lectures

Demonstrations

Role Playing

Oral Reports

Games

Manipulative Practice

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

Transparencies

Handouts

Blackboard

16 mm Films

Reading assignments

Textbooks

Child Care Equipment and Supplies

APPENDIX F

WARD SECRETARY PROGRAM

PRESENT INSTRUCTIONAL STRATEGIES

Lecture s

Demonstration s

Independent Package

Small Group Discussion

Youth Tutor Youth (YTY)

Tutoring (Instructor)

Role Playing

Library Assignments

MATERIALS UTILIZED WITH INSTRUCTIONAL STRATEGIES

Tapes

Filmstrips

Transparencies

Diagrams

16 mm Films

Ward Secretary Equipment and Supplies

Course objectives, outlines, study guides etc.

Textbooks

Blackboard

Multiple Type Tests

UNIVERSITY OF CALIF.
LOS ANGELES

SEP 21 1979

CLEARINGHOUSE FOR
JUNIOR COLLEGES